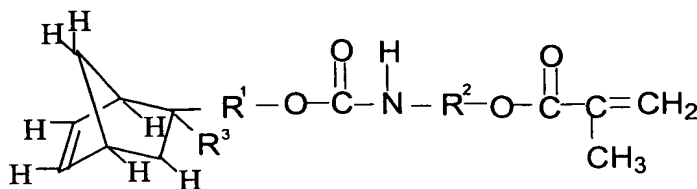


We claim:

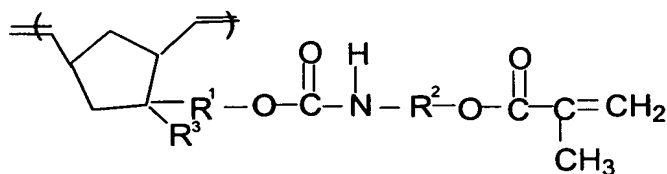
1. A norbornene compound with cross-linkable groups, comprising:



I

an effective amount of compound as formula I, wherein R^1 is $-(CH_2)_m-$ or $-C(O)O(CH_2)_n-$, in which $1 \leq m, n < 4$, and m, n is an integer; R^2 is $-(CH_2)_p-$, in which $1 < p \leq 4$, and p is an integer; and R^3 is $-H$ or CH_3 .

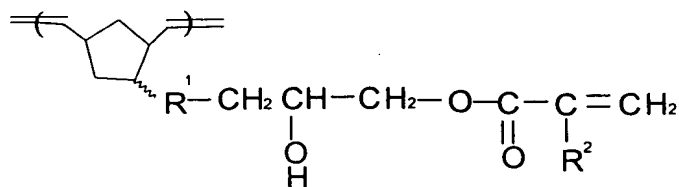
2. A norbornene polymer with cross-linkable olefin side chain, comprising:



II

an effective amount of compound as formula II, wherein R^1 is $-(CH_2)_m-$ or $-C(O)O(CH_2)_n-$, in which $1 \leq m, n \leq 4$, and m, n is an integer; R^2 is $-(CH_2)_p-$, in which $1 \leq p \leq 4$, and p is an integer; and R^3 is $-H$ or CH_3 .

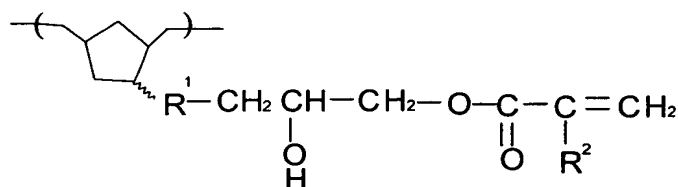
3. A norbornene polymer with olefin side chain, comprising:



II-2

an effective amount of compound as formula II-2, wherein R¹ is -O- or -(CH₂)_n-, in which 0 ≤ n ≤ 4 and n is an integer; and R² is H or CH₃.

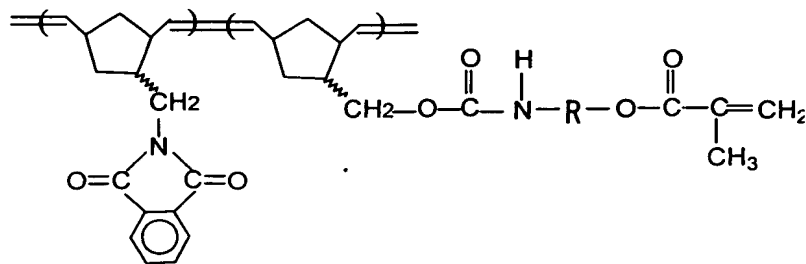
4. A norbornene polymer with olefin side chain, comprising:



II-3

an effective amount of compound as formula II-3, wherein R¹ is -(CH₂)-O- or -COO-(CH₂)_j-, in which 0 ≤ j ≤ 4 and j is an integer; and R² is H or CH₃.

5. A block co-polymer with cross-linkable side chain, comprising:

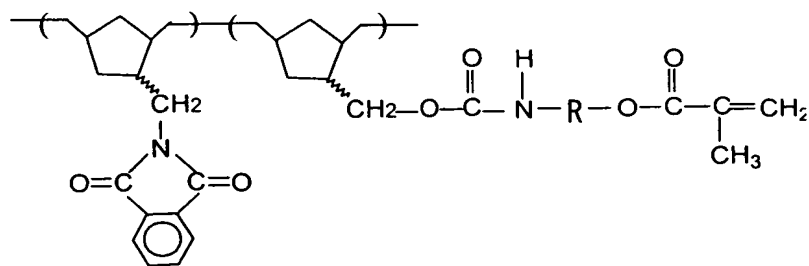


III

an effective amount of compound as formula III, wherein R is -(CH₂)_k-, in which 1 ≤ k ≤ 4, and k is an integer.

6. A saturated block co-polymer with cross-linkable side chain,

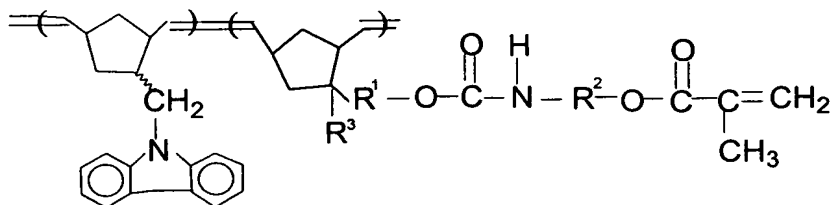
comprising:



III-2

an effective amount of compound as formula III-2, wherein R is $-(CH_2)_k-$, in which $1 \leq k \leq 4$ and k is an integer.

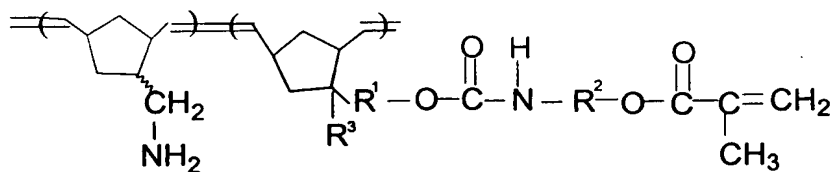
7. A block co-polymer with carbazole group and cross-linkable olefin side chain, comprising:



III-3

an effective amount of compound as formula III-3, wherein R^1 is $-(CH_2)_m-$ or $-C(O)O(CH_2)_n-$, in which $1 \leq m, n \leq 4$, and m or n is an integer; R^2 is $-(CH_2)_p-$, in which $1 \leq p \leq 4$ and p is an integer; and R^3 is -H or CH_3 .

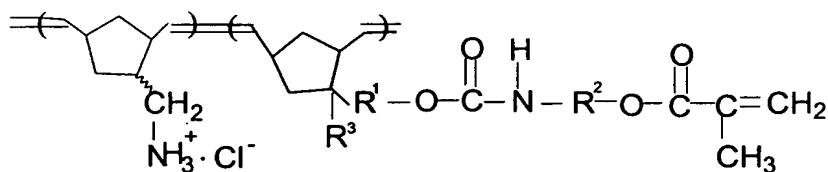
8. A block co-polymer with amino group and cross-linkable olefin side chain, comprising:



III-4

an effective amount of compound as formula III-4, wherein R^1 is $-(CH_2)_m-$ or $-C(O)O(CH_2)_n-$, in which $1 \leq m, n \leq 4$, and m or n is an integer; R^2 is $-(CH_2)_p-$, in which $1 \leq p \leq 4$ and p is an integer; and R^3 is $-H$ or CH_3 .

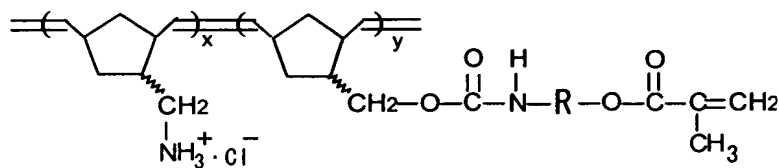
- 5 9. A water-soluble block co-polymer with cross-linkable side chain, comprising:



IV

- 10 an effective amount of compound as formula III, wherein R^1 is $-(CH_2)_m-$ or $-C(O)O(CH_2)_n-$, in which $1 \leq m, n \leq 4$, and m, n is an integer; R^2 is $-(CH_2)_p-$, in which $1 \leq p \leq 4$ and p is an integer; and R^3 is $-H$ or CH_3 .

10. A water-soluble block co-polymer with cross-linkable side chain, comprising:

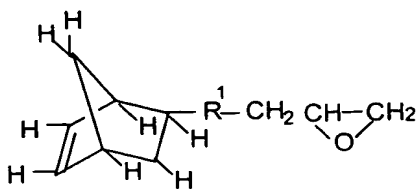


15

IV-2

an effective amount of compound as formula IV-2, wherein R is $-(CH_2)_k-$, in which $1 \leq k \leq 4$ and k is an integer.

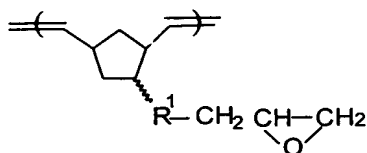
11. A norbornene compound with epoxy group, comprising:



V

an effective amount of compound as formula V, wherein R^1 is -
 $(CH_2) - O -$ or $-COO(CH_2)_j-$, in which $0 \leq j \leq 4$ and j is an
 5 integer.

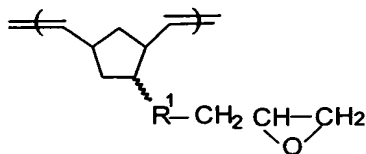
12.A norbornene polymer with epoxy side chain, comprising:



VI

an effective amount of compound as formula VI, wherein R^1 is
 10 - $(CH_2) - O -$ or $-COO(CH_2)_j-$, in which $0 \leq j \leq 4$ and j is an
 integer.

13.A norbornene polymer with epoxy side chain, comprising:

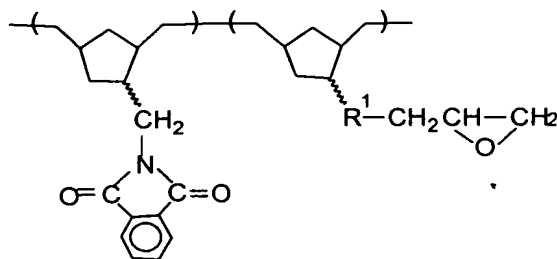


VI-2

an effective amount of compound as formula VI-2, wherein R^1
 15 is - $(CH_2) - O -$ or $-COO(CH_2)_j-$, in which $0 \leq j \leq 4$ and j is an
 integer.

14.A norbornene block co-polymer with phthalamide and epoxy

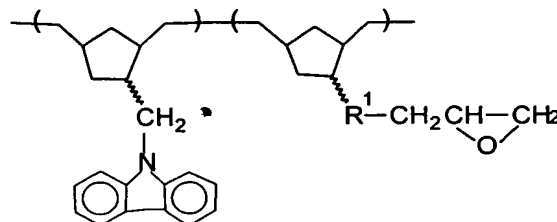
group, comprising:



VII

an effective amount of compound as formula VII, wherein R¹ is - (CH₂) -O- or -COO(CH₂)_j-, in which 0 ≤ j ≤ 4 and j is an integer.

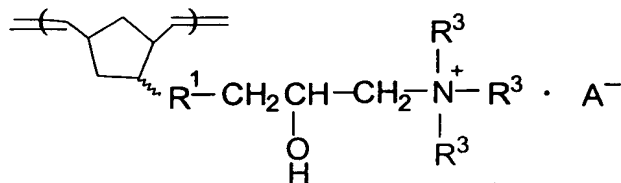
15.A norbornene block co-polymer with carbazole and epoxy groups, comprising:



VIII

an effective amount of compound as formula VIII, wherein R¹ is - (CH₂) -O- or -COO(CH₂)_j-, in which 0 ≤ j ≤ 4 and j is an integer.

16.A norbornene polymer with quaternary ammonium side chain, comprising:

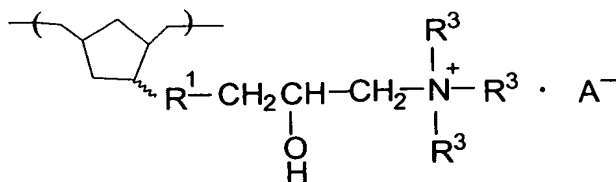


VIII

an effective amount of compound as formula VIII, wherein R^1 is $-(CH_2)_j-O-$ or $-COO(CH_2)_j-$, in which $0 \leq j \leq 4$ and j is an integer; R^3 is H, CH_3 or C_2H_5 ; and A^- is Cl^- , Br^- or CH_3COO^- .

5

17.A norbornene polymer with quaternary ammonium side chain, comprising:



VIII-2

an effective amount of compound as formula VIII-2, wherein R^1 is $-(CH_2)_j-O-$ or $-COO(CH_2)_j-$, in which $0 \leq j \leq 4$ and j is an integer; R^3 is H, CH_3 or C_2H_5 ; and A^- is Cl^- , Br^- or CH_3COO^- .

10